

CLAIMS:

1. A method of automating the setting of parameters, such as voltage level and pulse duration, for a jetting tube for dispensing liquids comprising the steps of:
 - a) selecting a voltage range and a pulse duration range with each value in the
5 range having an expected likelihood of suitability compared to other values in the range;
 - b) selecting a first combination of the parameters of voltage level and pulse duration;
 - c) supplying a pulse or series of pulses having the selected voltage and
10 duration to the jetting tube; and
 - d) detecting whether a droplet is formed, wherein
 - e) if a droplet is not detected selecting a further parameter combination; and
 - f) repeating steps (c) (d) and (e) are repeated until a droplet is detected; and
 - g) if a droplet is formed and detected, analysing the droplet further to
15 ascertain, whether secondary characteristics of the droplet are satisfactory; and wherein;
 - h) if the secondary characteristics of the droplet are not satisfactory selecting a further parameter combination and repeating steps (c) to (g); and
 - ~~t) if the secondary characteristics of the droplet are satisfactory saving those~~
20 parameters for that jetting tube.
2. A method as claimed in claim 1 wherein the expected likelihood of suitability of values in the ranges of pulse duration and voltage are determined from statistical analysis of results of previous jetting experiments.
3. A method as claimed in claim 2 wherein the selection of the first parameter
25 combination commences with a statistically popular occurrence of voltage and pulse duration determined from the statistical analysis of results of previous jetting experiments.
4. A method as claimed in claim 3 wherein if the first parameter combination does not produce an acceptable droplet, second subsequent parameter combinations to be
30 selected alternate either side of the first parameter combination with the next most popular occurrence which has not yet been used.
5. A method as claimed in claim 4 wherein one of the parameters is maintained constant while the second parameter is varied until all possible combinations of the second parameter with the one value of the first parameter are tested.
- 35 6. A method as claimed in any preceding claim wherein the secondary characteristics of the droplet include stability and flight angle.

7. A method as claimed in any preceding claim wherein the step of detecting whether a droplet is formed includes the step of taking an image of the droplet or droplets produced by the combination of parameters and analysing that image to identify whether a droplet is formed.
- 5 8. A method as claimed in claim 7 wherein the step of analysing the droplet further to ascertain, whether secondary characteristics of the droplet are satisfactory involves analysing an image or series of images of a droplet.
9. A method as claimed in any preceding claim wherein a frequency distribution of voltage and pulse duration from previous jetting experiments is prepared prior to
10 selecting the first combination of parameters from which statistically unlikely values at either end of the range of values are excluded from the range of parameters to be used.
- 10 A micro jetting system for dispensing liquids including a means for automating the setting of voltage level and pulse duration parameters of the micro jetting system including
- 15 a jetting tube and control means for supplying a voltage pulse to the jetting tube having a known voltage for a known pulse duration;
means for capturing and analysing a image of a droplet jetted from the tube;
means for building or storing a frequency distribution of voltage and pulse duration from previous jetting experiments; and control means arranged to
- 20 a) based on the frequency distribution, select a voltage range and a pulse duration range with each value in the range having an expected likelihood of suitability compared to other values in the range;
- b) select a first combination of the parameters of voltage level and pulse duration;
- 25 c) supply a pulse or series of pulses having the selected voltage and duration to the jetting tube; and
- d) detect whether a droplet is formed, wherein
- e) if a droplet is not detected select a further parameter combination; and
- f) repeat steps (c) (d) and (e) are repeated until a droplet is detected; and
- 30 g) if a droplet is formed and detected, analyse the droplet further to ascertain, whether secondary characteristics of the droplet are satisfactory; and wherein;
- h) if the secondary characteristics of the droplet are not satisfactory select a further parameter combination and repeating steps (c) to (g); and
- i) if the secondary characteristics of the droplet are satisfactory save those
35 parameters for that jetting tube.

11. A micro jetting system as claimed in claim 11 wherein the first combination of parameters selected is the statistically most common voltage and pulse duration value based on the frequency distribution.
12. A micro jetting system as claimed in claim 12 wherein further parameter
5 combinations are dispensed in sequence where necessary until a satisfactory combination is found, with combinations to be selected alternating either side of the statistically most common voltage and pulse duration with the next most popular occurrence which has not yet been tried.